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Dr. Sacheverell, in the reign of Queen Anne, and those of Atterbury, Bishop of Rochester, the Earl of Macclesfield, and the Earl of Oxford, in that of George I. The circumstances attending the trial of the late Queen Caroline, in 1820, are fully known, and need no mention in this place; but, perhaps, the most interesting and romantic episode in the history of the old Houses of Parliament is that of the Gunpowder Plot, in 1605. It was a strange scheme of vengeance skilfully planned, the detection of which brought down a fearful retribution on the heads of the conspirators. This affair has made so deep an impression on the minds of those in authority, that a practice is still continued of carefully examining the cellars and lower building, before the commencement of every parliamentary session.

But we have said enough of the old building, a building described as unworthy of so august a body as the parliament of Great Britain. A new and splendid edifice has arisen in place of the old structure; and while it is probably the largest Gothic building in the world, is one of the most magnificent edifices ever erected in Europe. It covers an area of nearly eight acres. The first stone was laid on the 27th of April, 1840. The architect is Charles Barry, R.A. "In its style and character the building reminds us of those magnificent civic palaces, the town-halls of the Low Countries,—at Ypres, Ghent, Louvain, and Brussels,—and a similarity in its destination renders the adoption of that style more appropriate than any form of classic architecture. The stone employed for the external masonry is a magnesian limestone, from Austen, in Yorkshire, selected with great care from the building stones of England by commissioners appointed, in 1839, for that purpose. The river-terrace is of Aberdeen granite. There is very little wood about the building; all the main beams and joists are of iron; and the Houses of Parliament, it is said, can never be burnt down again. The east or the river-front may be considered the principal. This magnificent façade, 900 feet in length, is divided into five principal compartments, panelled with tracery, and decorated with rows of statues and shields of arms of the kings and queens of England, from the Conquest to the present time.*

The river-front includes the residence for the Speaker at the north end, the corresponding terminal towards the south being the residence for the Usher of the Black Rod. Between the two extremes, and comprising what is called the curtain

* Murray's "Modern London."

portions, are the libraries for the House of Peers and the libraries for the House of Commons; in the immediate centre is the conference-room for the two houses. All this is on the principal floor, about fifteen feet above the terrace, or high-water-mark. The whole of the floor above the libraries, and overlooking the river, is appropriated to committee-rooms for the purposes of parliament; the Peers occupying about one-third towards the south, and the Commons two-thirds towards the north. The House of Peers and House of Commons are situated in the rear of the front building, or that next the river; and will, when completed, be enclosed also towards the west, so as to be entirely supported by Parliamentary offices. The plan of this truly national edifice is exceedingly simple and beautiful. The Central-hall, an octagon of seventy feet square, is reached through St. Stephen's-hall and porch, communicating, by noble flights of steps, with Westminster-hall, and forming an approach of unequalled magnificence. From the Central-hall, a corridor to the north leads to the Commons'-lobby and House of Commons; and a corridor to the south, to the Peers'-lobby and the House of Peers; still further to the south are Victoria-hall, the Royal Gallery, and the Queen's Robing-room, communicating with the Royal-staircase and the Victoria-tower, at the south-west corner of the pile, now rearing itself in Abingdon-street, intended for her Majesty's state entrance. The Royal Entrance is 75 feet square, and will, when completed, be 340 feet in height. The height of the entrance archway is 65 feet, and is peculiarly rich in some most beautiful architectural ornaments.

Various other towers break the monotony of the river-front. The central tower is sixty feet in diameter, and 300 feet high. The clock-tower is forty feet square, with a richly-decorated belfry rising to the height of 320 feet.

The Houses of Parliament are perhaps the most splendid structure of the kind in Europe; a little more taste might perhaps have been displayed in particular parts; there might have been more grandeur and simplicity in the *tout ensemble*,—but it is, nevertheless, singularly in keeping with the character of the bodies who meet within its walls, and with the constitution whose working it witnesses. The adherence to antique forms, combined with the gorgeous magnificence, which modern science and research have introduced into the art of decoration, are emblematic of the spirit which now animates the English nation—the reverent clinging to the past in union with courageous and hopeful progress.

WILLIAM HARVEY, M.D.

THE DISCOVERER OF THE CIRCULATION OF THE BLOOD.

THERE are two classes of persons who succeed in obtaining "a name among men," and who acquire what the world calls "immortality." In the *first* class are those bold and enterprising individuals who explore regions hitherto unknown, who found colonies and cities, who rear towers and pyramids, who construct tunnels and bridges, who guide the pencil, the chisel, or the pen. These pant for fame, and, in the majority of cases, obtain the object of their ambition. In a *second* class are those who—without seeking or desiring it, having no motive to prompt them beyond the acquisition of knowledge for its own sake, or as a means of benefiting those around them, patiently persevere in a course of industrious investigation and research, and after enduring for a season contempt and ridicule—find their theories established beyond all possibility of refutation, and their names enrolled amongst those of the best benefactors of mankind.

In this latter class we place WILLIAM HARVEY, an English physician, celebrated as the discoverer of the circulation of the blood. He was born at Folkstone, in Kent, April 2, 1578. His parents, who were respectable, sent him to a grammar-school at Canterbury, whence, having made con-

siderable progress in study, he was admitted to Caius College, Cambridge, in 1593, where he devoted himself to the study of logic and natural philosophy for nearly six years. Being greatly desirous of improvement, especially in medical science, he went abroad; and after visiting France and Germany, he removed to Padua, at that period a celebrated school of medicine, where he attended the lectures of Fabricius ab Aquapendente on anatomy, of Minadous on pharmacy, and of Casserius on surgery. There he took the degree of doctor of medicine in 1602; and on his return to England, he obtained a similar honour at Cambridge. He settled in London, and at the age of thirty he was elected Fellow of the College of Physicians, and shortly after appointed Physician to St. Bartholomew's Hospital. In 1615 he was elected by the college to deliver the Lumleian lectures on anatomy and surgery, in the course of which undertaking he is supposed to have first brought forward his views upon the circulation of the blood, which he afterwards established more fully, and which, about 1623, he was induced to publish.

As this discovery has "immortalized" the name of Harvey, it may not be uninteresting to remark, that before his develop-

ment, it was believed that the arteries, or vessels through which the blood flows from the heart, did not contain blood at all, but only air; and, indeed, the word artery was originally used to signify the windpipe or an air tube. The body, it was thought, was fed with blood entirely through the veins, which carried it at last to the heart, where it was, in some way or other, which the most learned had failed to explain, absorbed or drunk up.

No one imagined that there was any *circulation* of the blood till Harvey demonstrated that the same blood which the veins brought to the heart, the arteries immediately carried away again from it; a discovery, the glory of which he lived for many years to enjoy.

The opinions of Harvey upon this difficult and important subject differ so materially from those which he had previously entertained, that it may be interesting further to ascertain the steps by which they were attained. Boyle, in his "Treatise on Final Causes," states, that in the only conversation he ever had with Harvey, he was told by him, that the idea of the circulation was suggested to him by the consideration of the obvious use of the valves of the veins, which are so constructed as to impede the course of the blood *from* the heart through those vessels, while they permit it to pass through them *to* the heart. Before the time of Harvey, the opinions on the circulation were numerous and inconsistent, resting more upon imagination than upon any careful observation of facts; while those of Harvey were drawn from the most accurate dissections of dead and living animals, and supported by arguments depending entirely upon the anatomical structure and obvious uses of the parts.

The following is a brief abstract of the principal steps in this great and original discovery in physiology:—

He states that the heart has periods of action and of rest; but in warm-blooded animals its motions are so rapid that the different steps of them cannot be distinguished. In cold-blooded animals they are more slow; and in warm-blooded animals also, after the examination of its action, by opening the chest of a living animal, has been continued some time. During its action the heart is raised, and its point tilted forward so as to strike against the parietes of the chest. It contracts in every direction, but more especially on its sides; it also becomes harder, as other muscles do during their contraction. In fishes and cold-blooded animals the heart may be observed to become paler during its diastole. If a wound be made in the ventricle, the blood is ejected from it during its contraction. From these facts Harvey concluded that the essential action of the heart is its systole, or contraction, and not its diastole, or dilation, as was supposed by physicians before his time; and that the result of this contraction is the expulsion of the blood into the pulmonary artery and aorta. The dilation of the arteries or pulse is synchronous with, and caused by, the propulsion of the blood during the contraction of the ventricle, and is a *passive*, and not, as was previously supposed, an *active*, operation of the vessels. If the motions of the heart be carefully observed for some minutes, it will be seen, first, that the two auricles contract simultaneously, and force the blood contained in them into the ventricles; and, secondly, that the ventricles in their turn assume the same action, and propel most of the blood into the pulmonary artery and aorta, from which it is prevented from returning by the valves situated at the entrance of those vessels.

The author next proceeds to describe the manner in which the blood passes from the right to the left side of the heart. During *fetal* life, he says, this is sufficiently evident. Part of the blood passes direct from the right to the left auricle through the foramen ovale, while the rest is conveyed into the right ventricle, and by its contraction forced into the pulmonary artery, and so through the ductus arteriosus into the descending aorta; for, as he observed, the lungs do not admit of its passage through them in the *fetus*. In the *adult* a new condition is introduced, namely, the function of the lungs, by which, he said, the question was so much obscured that physicians were unable to give a correct explanation of

the phenomena. The consideration of the obvious use of the valves had led Galen to maintain that a portion of the blood contained in that vessel passed through the lungs into the pulmonary veins; but this passage he supposed to depend more upon the action of the lungs themselves than of the heart. Harvey carried out this argument still further, and maintained from it that the whole of the blood which is propelled from the right side passes through the lungs to the left side of the heart. In like manner, he showed that the blood is propelled from the left ventricle into the arteries, and so distributed to all parts of the body. He next proceeded to give approximate calculations of the quantity of blood which passes from the veins through the heart in a given time. This he showed to be so much more than is required for the nutrition, or can be supplied to the veins by the absorption of alimentary substances, that the surplus must of necessity return through the various tissues of the body to the veins again. He then argued, from the construction of the valves of the veins, that the course of the blood in them must be from the smaller to the larger divisions, and thus to the heart again. These views he still further confirmed by reference to the now well-known effects of ligatures placed on a limb with different degrees of tightness. If the ligature be so placed as to compress the veins alone, they become swelled and tumid beyond the ligature, and quite empty between it and the heart, whilst the pulsations of the artery remain unaltered. If it be drawn a little tighter, the pulsations of the artery cease beyond, but are felt more violent than usual just within the ligature. Such is a brief abstract of the principal steps by which Harvey arrived at his great discovery.

This discovery was so directly opposed to all the previous notions of physicians, that its author anticipated that prejudices would be indulged, that objections would be made, that old established opinions would be opposed to his, and that he might have to encounter coolness if not opposition. His anticipations proved correct.

Amongst those who opposed the opinions of Harvey were Primrosius, Parisanus, and Riolanus. Parisanus was ably refuted by Harvey's friend, Dr. George Ent, Fellow of the College of Physicians; and other advocates of Harvey's views appeared on the continent. The only man who was honoured by a reply from Harvey himself, was Riolanus, professor of anatomy at Paris, in answer to whom, he published two letters. Some of Harvey's opponents, when they could no longer answer his objections, attempted to invalidate his claim to the discovery, and would fain have transferred that honour to the famous Father Paul, of Venice, to the Spanish physician, Seretus,—whom Calvin caused to be burnt for heresy,—and even to the ancient Hippocrates. But these attempts were vain; the reputation of Harvey was in no degree diminished by these attacks, and it is now admitted that whatever hints may be found in the writings of his predecessors, he first clearly demonstrated the system of sanguineous circulation, and thus brought about one of the greatest revolutions in medical science. Sprengel, in his "History of Medicine," pays a just tribute to the conduct of Harvey towards those who differed from him on this grand subject; he says, "In the whole of this controversy, the discretion and nice modesty of Harvey afford the best model for naturalists and scientific writers." The fact was, that Harvey had been so much disgusted by the disputes in which he was involved on the publication of his views on the circulation of the blood, that he determined to publish nothing more; and it was only at the earnest request of his friend, Dr. Ent, that he was induced to allow his "Exercitationes de Generatione, &c.," to be printed. This work, though it may not be equal to his first great work, shows the extent and importance of his discoveries in this branch of physiology. It abounds with curious facts unnoticed by Aristotle and succeeding writers; and it would, no doubt, have been still more interesting, had not the plunder and destruction of his museum at Whitehall, by his political adversaries, while he was in the king's service, deprived him of the fruits of some of his anatomical researches. "Harvey often said," observes Aubrey, "that of all the losses he sus-

tained, no grief was so crucifying to him as the loss of those papers and preparations, which for love nor money he never could retrieve or obtain."

In 1623, Harvey was appointed physician extraordinary to James I., and afterwards performed the duties of the ordinary physicianship. He was next physician in ordinary to Charles I., by whom he was highly esteemed, and in whose court he frequently exhibited the motion of the heart, and the other phenomena upon which his doctrines were founded. During the civil war he travelled with the king, and was with him at

of the College of Physicians, but in consequence of his age and infirmities he declined accepting the office. His brethren of the college had, a year or two before, testified their sense of his merits by erecting his bust in their hall, with an inscription recording his discoveries; and in return he testified his regard for the college by building for them a combination room, and by presenting to them a library and museum, and a paternal estate of £56 a year, for the institution of an annual festival and other purposes. Hence has originated the Harveian Oration.



WILLIAM HARVEY, M.D. FROM A PAINTING BY BEMMEL.

the battle of Edgehill and afterwards at Oxford; while staying at the latter place, the king made him master of Merton College, where he had previously received the degree of doctor of medicine. This was in 1645; but Harvey held the mastership only for a few months, in consequence of the restoration of Dr. Brent, the former master. Harvey then removed to London, where his house was plundered and burnt, and his papers and museum destroyed by the party then in ascendancy. The remaining years of his life were chiefly spent at Lambeth and Richmond. In 1654, he was elected President

In his old age Harvey was subjected to distressing attacks of the gout, to alleviate the pain of which he is said to have resorted to violent remedies which somewhat shortened his life. He lived, however, to complete his *eightieth* year. He died June 3, 1659, and was buried at Hempstead, in Essex, his funeral being attended by all the members of the college; a monument was afterwards erected there to his memory. He maintained to the last the esteem and respect of his contemporaries, and has secured the admiration of posterity.